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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/938,260	08/23/2001	Steven W. Russell	TI-25084	1259
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23494 7590 05/22/2003

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EXAMINER

FENTY, JESSE A

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 05/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/938,260

Applicant(s)

RUSSELL ET AL.

Examiner

Jesse A. Fenty

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 March 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-3, 5, 6, 9-13, 15 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Dabbaugh et al. (U.S. Patent No. 6,362,094 B1).

In re claims 1 and 11, Hasegawa discloses a semiconductor device, comprising:

A plurality of solid-state electronic devices;

A plurality of conductive elements (140, 820) electrically coupling the electronic devices;

A dielectric layer (310) positioned between two (rightmost and middle elements) or more of the conductive elements; and

A liner (210) comprising a compound including silicon and carbon, the liner positioned between at least a portion of the dielectric layer and a conductive element.

In re claims 2 and 12, Hasegawa discloses the devices of claim 1 and 11 respectively, wherein the liner is silicon carbide (column 4, line 14).

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In re claims 3 and 13, Hasegawa discloses the devices of claims 1 and 11 respectively, wherein at least one of the conductive elements (820) comprises a metallization line (column 5, line 4).

In re claims 5 and 15, Hasegawa discloses the devices of claims 1 and 11 respectively, wherein the dielectric layer comprises an intralevel dielectric layer positioned between conductive elements in a level of the integrated circuit structure.

In re claims 6 and 16, Hasegawa discloses the devices of claims 1 and 11 respectively, wherein the dielectric layer comprises an interlevel dielectric layer positioned between conductive elements in different levels of the integrated circuit structure.

In re claims 9 and 10, Dabbaugh discloses the device of claim 1. The limitations regarding how the conductive elements are formed are "product by process" limitations and are not given patentable weight. Applicant is reminded that, a "product by process" claim is directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); *In re Marosi et al*, 218 USPQ 289; and particularly *In re Thorpe*, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above caselaw makes clear. Therefore the cited prior art anticipates the claimed invention.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa as applied to claim 1 above, and further in view of Schrantz et al. (U.S. Patent No. 5,650,639).

In re claims 4 and 14, Dabbaugh discloses the devices of claims 1 and 11 respectively, but does not expressly disclose the conductive element comprising polysilicon. Schrantz et al. discloses a conductive element (108, 140) comprising polysilicon. It would have been obvious for one skilled in the art at the time of the invention use a polysilicon interconnect as disclosed by Schrantz for the device of Dabbaugh to ease the manufacturing process.

5. Claims 7 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dabbaugh et al. as applied to claims 1 and 11 above, and further in view of Hasegawa (U.S. Patent No. 5,646,440).

In re claims 7 and 17, Dabbaugh discloses the devices of claims 1 and 11 respectively, but does not expressly disclose the dielectric layer comprising a fluorinated dielectric material. Hasegawa discloses a dielectric layer comprising a fluorinated dielectric material (column 4, lines 46-48). It would have been obvious for one skilled in the art at the time of the invention to use a fluorinated dielectric layer disclosed by Hasegawa in place of the oxide layer disclosed by

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Dabbaugh for the purpose, for example, of creating two layers of interlayer dielectric for the purpose, for example, of protecting the conductive interconnects from corrosion, decreasing power consumption and enhancing the speed of the device (Hasegawa; column 3, lines 12-24)

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dabbaugh in view of Hasegawa and further in view of Chooi et al. (U.S. Patent No. 6,465,888 B2).

In re claim 8, Dabbaugh discloses the device of claim 1, but does not expressly disclose the dielectric layer comprising PTFE. Hasegawa discloses silicon fluorine dielectric materials that would enhance device performance. Chooi discloses a similar device to Hasegawa wherein the dielectric layer (220) comprises many fluorine-composing compounds, including PTFE. It would have been obvious for one skilled in the art at the time the invention was made to substitute PTFE for silicon-fluorine as Chooi discloses both materials are exemplary choices for low-k dielectrics in devices such as these for the purpose of enhancing device performance (Chooi; column 1).

### ***Response to Arguments***

7. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

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*Conclusion*

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jesse A. Fenty whose telephone number is 703-308-8137. The examiner can normally be reached on 5/4-9 1st Fri. Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on 703-308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-746-3892 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

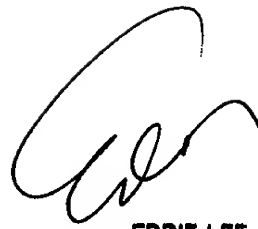
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Jesse A. Fenty  
Examiner  
Art Unit 2815

JAF  
May 17, 2003



**EDDIE LEE**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**